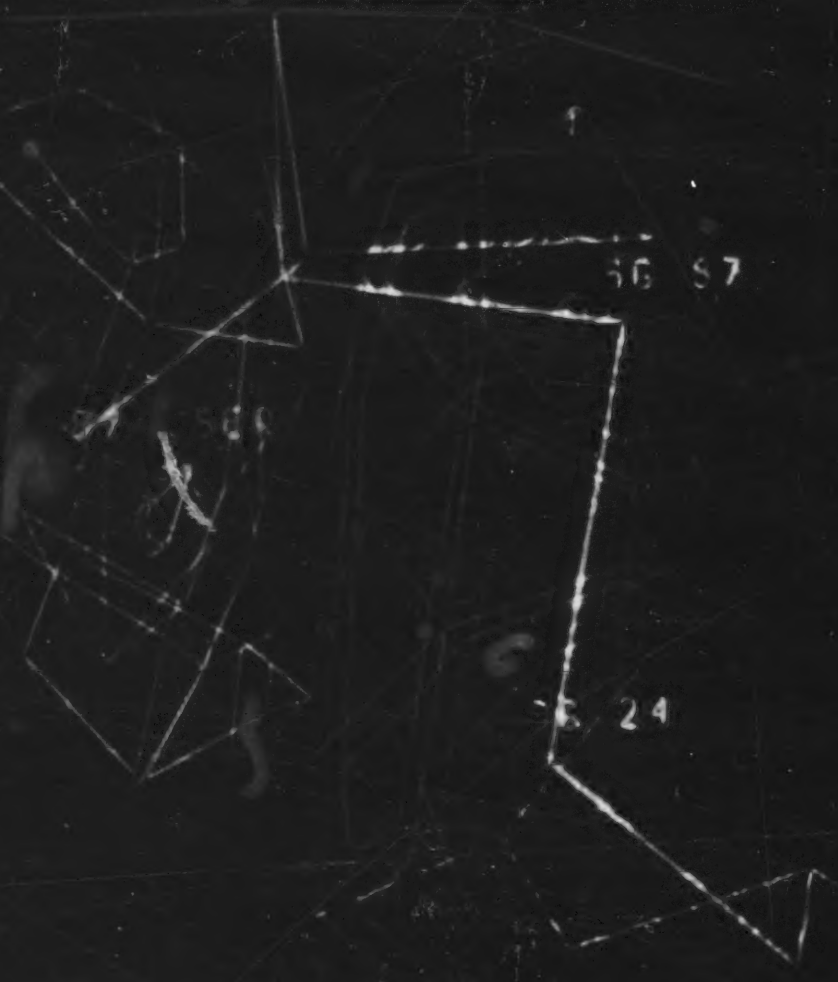
AR50-1

JULY 14, 1986

CHEMICAL & ENGINEERING

NEWS

FINAL PROGRAM
ACS meeting in Anaheim
Page 31



05111 79C096 9 K AR 6428SL
CONGRESSIONAL INFO SERV-SRI
4520 EAST WEST HWY SUITE 800
SRI ACQUISITIONS
BETHESDA MD 20814

Enzyme Chemistry

Mutagenesis techniques shed light on structure-function relationships Page 7

CHEMICAL & ENGINEERING
NEWS

Volume 64, Number 28
CENEAR 64 (28) 1–132
ISSN 0009-2347

JULY 14, 1986

News of the Week

■ **NIH panel says risk of contracting AIDS from blood transfusions is very small.** **Page 4**

■ **Equal Employment Opportunity Commission accuses Du Pont of age discrimination in its early retirement program last year.** **Page 5**

■ **Du Pont to acquire health care unit, packaging business, and half-interest in distributor of crop protection products.** **Page 5**

■ **Biotechnology firms association will form captive insurance company to provide liability coverage for its members.** **Page 5**

■ **Office of Technology Assessment recommends changes to improve transportation of hazardous materials.** **Page 6**

■ **Italy's Montedison expands health care activities through purchase of Fermenta, Sweden-based antibiotics firm.** **Page 6**

Cover: Difference electron density map superimposed on wild-type structure and on initial crystallographic model of mutant subtilisin. Computer graphic courtesy of Genentech Inc. and Genencor

Letters 2
Editor's Page 3

Concentrates
Business 15
Government 23
Science/Technology 26

The Departments
Meetings 115
People 130
Newscripts 132

Business

Growth rate of biotechnology stock values slows down after red-hot growth during first three months of the year. **Page 17**

International Business

New CEFIC president Aarnout Loudon outlines the challenges that lie ahead and talks about the European chemical industry. **Page 19**

Government

The Army plans to burn chemical weapons at the places where they are stored, but nearby communities likely will protest. **Page 24**

Technology

Argonne's program to offer premium coal samples to researchers is progressing; first five samples have been collected. **Page 26**

Education

Children's science fair sponsored by Davison Chemical for second year generates considerable enthusiasm from students and parents. **Page 30**

Final Program

Program for ACS national meeting in Anaheim includes listing of all technical papers, exposition exhibitors, social events. **Page 31**

News Focus

Chemists and biochemists are turning to molecular biology techniques to investigate the structure-function relationships of enzymes. **Page 7**

Chemical & Engineering News

1155—16th St., N.W., Washington, D.C. 20036

Editor: Michael Heylin
Assistant Managing Editors: David M. Kiefer, James H. Krieger, Janice R. Long, Donald J. Soisson, William J. Storck
Staff Editor: Ernest L. Carpenter
Senior Editors: New York: Earl V. Anderson; Chicago: Joseph Haggin; Washington: Lois R. Ember, Wilbert C. Lepkowski, Rebecca L. Rawls, Howard J. Sanders
Associate Editors: Doron Dagani, Bette Hileman, Richard J. Seltzer, Pamela S. Zurer, Mairin B. Brennan
Service Departments Editor: Dolores Miner
Editing Services: Joyce A. Richards (Head), Anne Riesberg (Editorial Assistant), Patricia Oates (Administrative Assistant)

News Bureaus: New York: (212) 697-3223 David Webber (Head), Stephen C. Stinson (Associate Editor). Chicago: (312) 256-4143 Ward Worthy (Head). Houston: (713) 973-8161 Bruce F. Greek (Head). Washington: (202) 872-4495 David J. Hanson (Associate Editor). West Coast: (415) 653-3630 Rudy M. Baum (Head). **Foreign Bureau:** London: (01) 540-0414 Dermot A. O'Sullivan (Head), Patricia L. Layman (Associate Editor)
Graphics and Production: Leroy Corcoran (Manager). Alan Kahan (Art Director). Barbara Fryer (Production/Art Director). Linda Mattingly (Staff Artist). Diane K. Lilienkamp (Costing). **Business Manager:** Arthur Poulos
Circulation Development: Cynthia G. Smith

ADVISORY BOARD: William J. Bailey, Myron Foveaux, Harry B. Gray, Vincent L. Gregory Jr., John D. Holmfeld, Donald F. Hornig, Isabella Karle, W. Thomas Lippincott, John M. Logsdon, Dorothy Nelkin, Richard Nicholson, Howard A. Schneiderman, Ellen K. Silbergeld, Howard E. Simmons, William P. Slichter, H. F. Tomfohrde III, Mark S. Wrighton, Richard N. Zare

Published by
AMERICAN CHEMICAL SOCIETY
(202) 872-4600; TDD (202) 872-8733
John K Crum, Executive Director

EDITORIAL BOARD: Barbara G. Wood (*Chairman; Board of Directors Chairman;* Paul V. Smith Jr.; *President-Elect:* Mary L. Good; *Immediate Past-President:* Ellis K. Fields; Ernest L. Eliel; E. E. McSweeney; John H. Nelson; and Jean'ne M. Shreeve.

© Copyright 1986, American Chemical Society

Subscription Service: Send all new and renewal subscriptions with payments to: Director, Business Management Division, ACS, P.O. Box 57136, Washington, D.C. 20037. Correspondence and telephone calls for changes of address, claims for missing issues, subscription service, status of records and accounts should be directed to: Manager, Membership & Subscription Services, ACS, P.O. Box 3337, Columbus, Ohio 43210; (614) 421-3776.

Changes of Address: Include both old and new addresses with ZIP code numbers and mailing label from a recent issue. Allow four weeks for change to become effective. Claims for missing numbers will not be allowed if loss was due to failure of notice of change of address to be received in the time specified; if claim is dated (a) North America: more than 90 days beyond issue date, (b) all other foreign; more than one year beyond issue date; or if the reason given is "missing from files."

Subscription Rates 1986. Printed editions: nonmembers U.S. 1 yr. $40, 2 yr. $68, outside U.S. 1 yr. $65, 2 yr. $118. Air freight rates available on request. Rates above do not apply to nonmember subscribers in Japan, who must enter subscription orders with Maruzen Co. Ltd., 3-10 Nihonbashi 2-chome, Chuo-ku, Tokyo 103, Japan. Tel: (03) 272-7211. Single copies: Current $5.00. Rates for back issues and volumes are available from Microforms & Back Issues Office, ACS, 1155—16th St., N.W., Washington, D.C. 20036. Back and current issues available on microfilm and microfiche. Rates on request from Microform Program, ACS.

Chemical & Engineering News (ISSN 0009-2347) is published weekly except for the last week in December by the American Chemical Society at 1155—16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to Chemical & Engineering News, Membership & Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. ACS assumes no responsibility for the statements and opinions advanced by the contributors to its publications.

Advertising Management
CENTCOM LTD.

(For list of offices see page 131)

LETTERS

Simple arithmetic

SIR: Although it is easy, as Douglas Frost writes (C&EN, May 12, page 2), to argue in favor of promoting the metric system of measurement, in all things and everywhere, it is time for teachers, technologists, and scientists to consider the virtues of two-way communication recommended by James Hay on the Editor's Page (page 3).

1. The old measures are so easily converted by technologists, etc. to the metric scales when necessary; especially now that we have electronic calculators.

2. The old measures, especially in length (including area and volume), have the notable merit of being divisible by three without encountering recurring decimals. Thus they are much easier for common people to understand.

3. The vested interest of generations of documentation and use of inches, feet, yards, acres, and miles should not, and cannot, be changed lightly without immense oppressive bureaucracy.

4. Do the metricalists propose to change the units of time and angular measurement from their basis of 60 in seconds and degrees? If not, they cannot even claim that they are creating a unified system.

5. The Centigrade scale of temperature is just as arbitrary in its basis as that of Gabriel Fahrenheit. Must we impose the change on the medical profession?

For these and other less glaringly obvious reasons, let us accept human nature and continue with our different and imperfect systems, and teach our young, and our old, to deal with the differences by simple arithmetic when needed.

R. M. Deanesly
Berkeley, Calif.

Implications of Folkers' speech

SIR: I wish to make two comments on Karl Folkers' Priestley Medal Address (C&EN, April 21, page 27). First, ACS has long had a policy discouraging the presentation of papers recommending new therapies for disease unless such therapies have been confirmed by appropriate medical authorities. Although the Priestley Medal Address is not the same as a contributed research paper, it is far more well attended and publicized than the average paper. By its very nature it carries the weight of authority. Thus, I think it inappropriate that Folkers reports "positive results" from a study of vitamin therapy in psoriasis, although he admits that the studies are not complete and results are not clear-cut. Public reports of positive therapeutic results unaccompanied by data should be made after acceptance of a research report by a referred journal.

Second, Folkers confuses the fact that the 10th edition of the Recommended Dietary Allowances (RDAs) was not released with the issue of whether people with diseases may have higher requirements for vitamins or other nutrients than healthy people. The RDAs are meant to be values for recommended dietary intake by healthy people. Some of the difficulty in defining the RDAs undoubtedly comes from the difficulty in defining "health." However, if sick people need much larger than ordinary intakes of vitamins or minerals, then we are talking about pharmacology, not nutrition. I think statements such as, "If science does not know the requirement ... how can anyone criticize a dose from a microgram to a gram?" are not very responsible. Such statements encourage the lay public to undertake self-supplementation with megadoses of various vitamins and minerals without any knowledge of the possible adverse effects of unbalanced intakes.

As a member of both the American Institute of Nutrition and the American Chemical Society, I am concerned about the implication of Folkers' speech. He is certainly correct when he says more research is needed about nutritional requirements in both health and disease. However, in our eagerness to make the world a better place through chemistry we must not forget our responsibility to the lay public, who often will believe what we scientists tell them.

Phyllis E. Johnson
USDA, ARS, Human Nutrition Research Center
Grand Forks, N.D.

Values clarification

SIR: Joseph F. Coates, in his review of William W. Lowrance's new book (C&EN, May 12, page 40), manages to pontificate on matters on which he has obviously not done his homework. He remarks, "The current vogue among ethicists is values clarification." I don't know where Coates has been hanging out for the past 20 years, but it is clear that it hasn't been in the periodical room among the philosophy and ethics journals.

Values clarification has never been in vogue among philosophers and ethicists. It was spread among gullible public school officials and teachers by people such as Sidney Simon.

Values clarification has received powerful philosophical criticism, not support. See, for example, "Where the Values Movement Goes Wrong," by Edwin J. Delattre and William J.

Continued on page 120

Correction

• May 19, pages 45 and 59: California Polytechnic State University granted a total of 43, not 70, bachelor degrees in chemistry in 1985.

Biotechnology Stocks Outraced Stock Market in First Half

Their prices, however, are rising more slowly now, as initial offerings fill market and investors await product developments

David Webber, C&EN New York

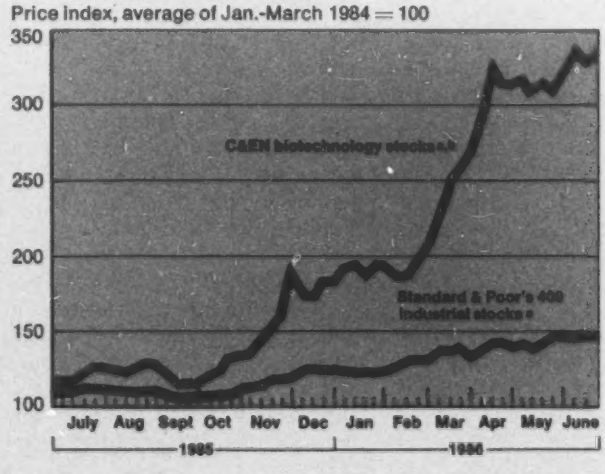
The biotechnology stock market, scene of red-hot growth throughout the first three months of the year, has now cooled off considerably. In the 12 months ending June 27, 1986, C&EN's biotechnology stock index increased 180%; Standard & Poor's 400 industrial stocks index rose 32%. In the first half of 1986, the biotechnology stock index shot up 86%; Standard & Poor's 400 climbed 20%. Since mid-April, however, biotechnology stock values have grown just 2%, half the appreciation of the S&P measure.

C&EN's biotechnology stock index is based on the composite market value—the product of stock price and number of shares of common stock outstanding—of a representative group of 18 biotechnology-based companies.

Several factors have worked to slow the rate of growth of biotechnology stock values. For one thing, the elements that combined to create the great surge in stock prices last fall—two high-priced acquisitions of biotechnology companies, government approval of Genentech's recombinant DNA human growth hormone, and encouraging results from human trials of interleukin-2—in general have now been factored into company stock prices by investors.

The most positive commercial development this spring was the Food & Drug Administration's approval of α-interferon for the treatment of hairy cell leukemia. The bringing to market of the first recombinant interferon—once expected to be the confirmation of genetic engineering's commercial promise—was a major achievement and helped raise stock prices. The approval, in particular, dusted off the prestige of Biogen, which developed the version of α-interferon being marketed by Schering-Plough. But the event lacked the broad, explosive impact of last year's developments, largely because the product's market, as constrained by FDA's limited indica-

Biotechnology stocks rose four times faster than stock market this year...



a Reindexed to weighted average for Jan.–March 1984 period to show relative change. Prices as of Friday close each week. b Based on stock prices for Advanced Genetic Systems, Amgen, Applied Biosystems, Biogen, Bio-Response, California Biotechnology, Centocor, Cetus, Chiron, Collaborative Research, Damon Biotech, DNA Plant Technology, Enzo Biochem, Genentech, Immunex, Molecular Genetics, Monoclonal Antibodies, and Ribi Immunochem.

. . . and prices of many of these stocks are still near their 52-week high

Company	Recent price[a]	% change[b]	52-week range High	52-week range Low
Advanced Genetic Sciences	$ 5	18%	$ 6⅛	$ 2½
Amgen	24¾	203	29⅜	6¾
Applied Biosystems	49½	106	51¾	18
Biogen	17¼	130	20⅝	7
Bio-Response	7⅜	9	10¾	5
California Biotechnology	22½	105	29¾	9¼
Centocor	41¾	126	45	14½
Cetus	37⅛	245	42½	10½
Chiron	25¼	216	31¾	4¾
Collaborative Research	7⅝	85	10¾	2¾
Damon Biotech	7¾	22	10½	5⅜
DNA Plant Technology	16½	94	21¼	7¼
Enzo Biochem	14½	18	19¼	10
Genentech[c]	92¾	293	98¾	19⅝
Immunex	19	223	20¼	4
Molecular Genetics	10¾	59	15½	6⅛
Monoclonal Antibodies	22¾	153	29	8¼
Ribi ImmunoChem	9	11	11½	5

a As of close on Friday, June 27, 1986. b June 28, 1985, to June 27, 1986. c Adjusted for 2-for-1 stock split in February 1986.

tion, is not likely to be particularly large.

The other major factor has been the drain on investment capital. Rushing to exploit the tremendous popularity of biotechnology stocks, many public companies issued secondary stock offerings while many other private firms, some of which had moved too slowly to benefit from the 1983 boom market and others of which are just a few years old, made initial public offerings. According to Linda I. Miller, biotechnology analyst at Paine Webber, investors have plowed about $500 million into initial and secondary offerings of biotechnology company stock since last fall.

Now, some analysts believe, the market may be nearing saturation with new stock. Teena L. Lerner, vice president at L. F. Rothschild, Unterberg, Towbin, points out that issues have been selling much more slowly recently. Institutional investors complain that they do not have time to go through all the biotechnology-related prospectuses piled on their desks, she says.

Parag Saxena, assistant vice president in charge of Citibank's emerging health care fund, agrees. "There's no juice left" in initial public offerings, he says. "The last several deals have gone at discounts." In the May offering by Genetics Institute, for example, stock in the well-respected firm was offered initially at $29¾, but the price fell as low as $24¾, he notes.

Miller points out that an equally important factor in the initial public offering market is continuing investor worry that too many companies are developing similar products. Both initial and secondary offerings from firms that have differentiated themselves are selling well, she says.

At this point, investors are believed to be awaiting a new series of positive developments, particularly in terms of product approvals. All eyes are on the hepatitis B vaccine developed by Chiron for Merck. Analysts expect FDA approval for the vaccine, which would be the first commercialized genetically engineered human vaccine, will come later this year. Approval undoubtedly would boost interest in stock in Chiron and companies with related projects—Biogen and Amgen, for instance—as well.

Even more eagerly awaited is approval of Genentech's tissue-type plasminogen activator (TPA), generally expected to be the first blockbuster-sized biotechnology product. Approval is generally expected in 1987, although optimists think FDA could send the heart attack treatment, eagerly sought by physicians, to market as early as this December. Other companies with TPA projects, such as Genetics Institute and Integrated Genetics, would also probably benefit in the stock market as a result.

Other major product approvals, such as for other interferons, could come next year. In the meantime, some stocks could gain from good progress reports on the continued testing of interleukin-2 in cancer patients.

Saxena believes it will take not only "significant events," as he puts it, but a series of them closely bunched to give biotechnology stocks the spark they need to rise above their current plateau. "My sense is that investors are still not really participating in the market but are looking for a pull-back in stock prices," he says. "So we have this dry spell now. Then, if there is a spurt of good news, prices will take off again."

Last fall, a major spark was the successive acquisitions of Hybritech by Eli Lilly and of Genetic Systems by Bristol-Myers, both in the $300 million range. The purchases validated the idea that there is a "technology value," as Miller puts it, to biotechnology companies, regardless of whether they already have major products on the market or are even operating profitably. The technology value is undoubtedly still there, but analysts do not expect any more major acquisitions soon.

"It's less likely, because companies are more well-funded now," Miller remarks. "They don't need big partners right now. I think acquisitions have run their course for this stock market cycle."

Furthermore, investment criteria for biotechnology-based companies are expanding. Investors are still focusing on product development, earnings, and management structure in their deliberations. Those are constant elements in the investment decision, of course, but the beginning trickle of genetically engineered products entering the marketplace means that, for the first time, investors will be able to judge companies on how well their products sell as well. □

Many private biotech firms went public this spring

Company[a]	Location	Number of shares (millions)	Initial offering price	Date of offering	Recent price[b]	% change
Biotherapeutics	Franklin, Tenn.	1.73[c]	$11	June 17	$21	91%
Calgene	Davis, Calif.	1.75	13–16	d	—	—
Cistron Biotechnology	Pine Brook, N.J.	na	na	d	—	—
Cytogen	Princeton, Mass.	3.00	13	June 18	11¾	−10
Genetics Institute	Cambridge, Mass.	2.88	29¾	May 20	26½	−11
Genzyme	Boston	3.25	10	June 5	12½	25
Hana Biologics	Berkeley, Calif.	1.43	10	June 5	7⅝	−24
Ingene	Santa Monica, Calif.	2.00	5	June 17	8	0
NPI	Salt Lake City	na	na	d	—	—
Oncogene Sciences	Mineola, N.Y.	2.30	6	April 3	5¼	−13
Repligen	Boston	11.50	11½	April 29	10⅞	−5
Synergen	Boulder, Colo.	1.74	11	March 7	11¾	7
Syntro	San Diego, Calif.	2.10	9–11	d	—	—
T Cell Sciences	Cambridge, Mass.	0.79[c]	16	May 15	21¼	33
Liposome Co.	Princeton, N.J.	2.50	8–10	d	—	—
Xoma Corp.	Berkeley, Calif.	2.30	16	June 6	16¼	2

a Representative selection of biotechnology firms making initial public offerings since January 1986. b As of close, July 3, 1986. c Units of common stock plus rights to purchase more stock. d In process. na = not available.

Army Proposes Burning Existing Chemical Weapons On-Site

Decision avoids risk of transporting arms to a central facility, but communities near weapons storage sites are likely to oppose plan

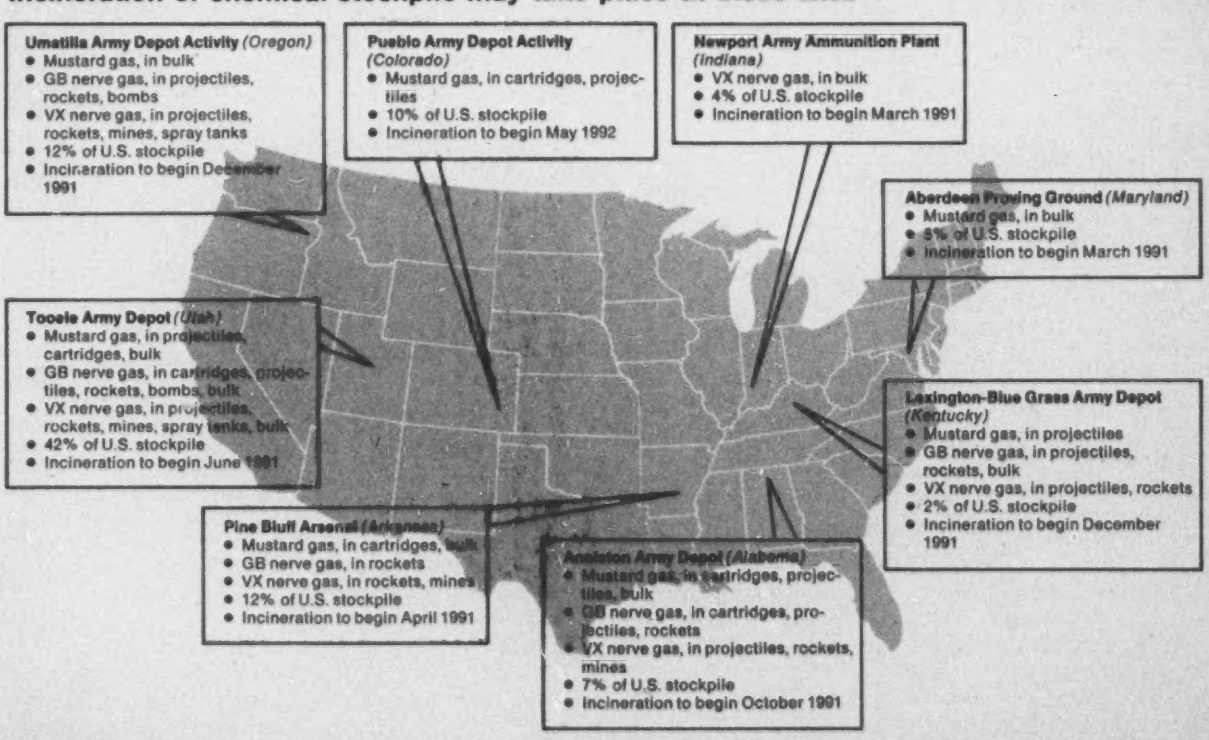
Under Congressional charge to destroy all existing chemical weapons by 1994, the Army has announced its preliminary decision to burn those weapons at the eight sites in the U.S. where they are now stored, thus avoiding the risks inherent in transporting them to one or two central disposal sites. The decision is likely to meet stiff opposition from the communities surrounding the eight sites and to stir up Congressional debate.

In selecting the on-site option, the Army rejected shipping all munitions and chemical agents to a national disposal site at Tooele Army Depot near Salt Lake City or to two regional sites. Under the regional plan, chemical stocks in western states would be shipped to Tooele, and those in eastern states would be transported to Anniston Army Depot, about 50 miles from Birmingham, Ala.

"There is no alternative for taking care of the stockpile that doesn't have a risk, including doing nothing, deputy undersecretary of the Army Amoretta M. Hoeber says. The risks associated with disassembling the weapons and incinerating the hardware and chemical agents are about the same whether the weapons are destroyed on the site or transported to regional sites. However, transportation by rail adds risks, including the potential for a terrorist attack against a fully loaded train, Hoeber explains.

Destruction of existing nerve and mustard gases in bulk form, as well as chemical-filled rockets, artillery shells (projectiles), mines, and bombs,

Incineration of chemical stockpile may take place at these sites


Umatilla Army Depot Activity (Oregon)
• Mustard gas, in bulk
• GB nerve gas, in projectiles, rockets, bombs
• VX nerve gas, in projectiles, rockets, mines, spray tanks
• 12% of U.S. stockpile
• Incineration to begin December 1991
Pueblo Army Depot Activity (Colorado)
• Mustard gas, in cartridges, projectiles
• 10% of U.S. stockpile
• Incineration to begin May 1992
Newport Army Ammunition Plant (Indiana)
• VX nerve gas, in bulk
• 4% of U.S. stockpile
• Incineration to begin March 1991
Aberdeen Proving Ground (Maryland)
• Mustard gas, in bulk
• 1% of U.S. stockpile
• Incineration to begin March 1991
Tooele Army Depot (Utah)
• Mustard gas, in projectiles, cartridges, bulk
• GB nerve gas, in cartridges, projectiles, rockets, bombs, bulk
• VX nerve gas, in projectiles, rockets, mines, spray tanks, bulk
• 42% of U.S. stockpile
• Incineration to begin June 1991
Lexington-Blue Grass Army Depot (Kentucky)
• Mustard gas, in projectiles
• GB nerve gas, in projectiles, rockets, bulk
• VX nerve gas, in projectiles, rockets
• 2% of U.S. stockpile
• Incineration to begin December 1991
Pine Bluff Arsenal (Arkansas)
• Mustard gas, in cartridges, bulk
• GB nerve gas, in rockets
• VX nerve gas, in rockets, mines
• 12% of U.S. stockpile
• Incineration to begin April 1991
Anniston Army Depot (Alabama)
• Mustard gas, in cartridges, projectiles, bulk
• GB nerve gas, in cartridges, projectiles, rockets
• VX nerve gas, in projectiles, rockets, mines
• 7% of U.S. stockpile
• Incineration to begin October 1991

Note: There are chemical stockpiles on Johnston Island, Pacific Ocean, and at U.S. Army bases in West Germany. Johnston Island stocks are to be incinerated first, in 1989. **Source:** Army

is expected to cost $2 billion, no matter which option is ultimately chosen. Public hearings on the destruction plan will be held during the next three months. The Army will issue its final environmental impact statement in December. And next January, Army Secretary John O. Marsh Jr. will issue his final decision.

In making his decision, Marsh will have to factor in Rep. Larry J. Hopkins' (R.-Ky.) strong opposition to the Army's incineration proposal. Hopkins is a supporter of the binary modernization program. In exchange for this support, he authored the amendment that requires the existing unitary chemical weapons be destroyed by incineration by Sept. 30, 1994. Unfortunately for the Army, Hopkins represents Madison County, which is home to the Lexington-Blue Grass Army Depot. He wants weapons that are stored there to be transported to another site for destruction. As a member of the House Armed Services Committee, he is in a position to see that his desire is fulfilled.

Hopkins argues "that the incineration process has never been properly validated under actual operating conditions." Countering that, Charles Baronian, deputy program manager and technical director for the Army's chemical demilitarization program, says: "We are satisfied from an engineering viewpoint that we have a good fix on the methodology to incinerate nerve agents and mustard. We've burned several thousand pounds of GB and VX nerve gas at the test incinerator at Tooele Army Depot. And in the early 1970s we incinerated 6 million lb of mustard gas at Rocky Mountain Arsenal in Denver." All safely, Baronian declares.

Hopkins' main concerns are that, "we have only about 1.6% of the total stockpile, the least amount stored at any of the sites ... [And] we have virtually the highest population density immediately surrounding the Madison County depot [of] any of the other sites."

Army spokesman Phil E. Soucy says Hopkins' argument is not with the Army. Rather it is "with the surrounding communities, the rest of the state, and the surrounding states." Berea, Ky., which is also near the depot, already has passed an ordinance prohibiting the transportation of chemical weapons through the town.

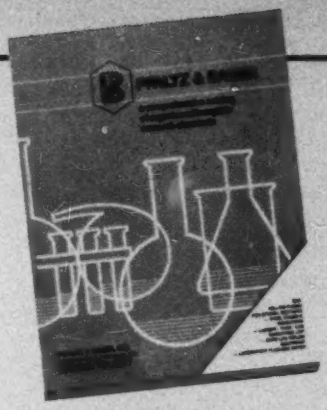
The Army's problem with Hopkins is overshadowed by the prickly dilemma West Germany presents. President Reagan has formally said the U.S. would remove its chemical stocks from its Army bases in West Germany by 1992. These are the only forward-deployed chemical weapons and therefore an important part of current U.S. deterrent.

How, when, and where those stocks will be moved is not addressed by the Army's recent preliminary decision. George A. Carruth, chief of the Army's chemical and NBC defense division, says the chemical stocks in West Germany "are subject to negotiation between the U.S. and West Germany, and when they are removed is partly up to the desires of West Germany." He wouldn't comment on the possibility that these weapons might be burned on-site in West Germany. But transportation across Germany and perhaps other European states is likely to raise an uproar.

Equally contentious would be transportation of the weapons to the continental U.S. for destruction. When chemical weapons were removed from Okinawa in the late 1960s and early 1970s, they were to be transported to and stored at a West Coast Army depot. The uproar was so great that Congress passed a law in the early 1970s prohibiting their importation. Those weapons were sent to Johnston Island, about 800 miles southwest of Hawaii, for storage. An incinerator is now being built on the island to destroy the chemical weapons. If all goes as scheduled, they will be the first of the U.S. stockpile to be destroyed, in June 1989.

Soucy says removal of the West German stocks "is going to be a State Department issue. The Army will execute any instructions it receives." An aide for Hopkins says the presumed instructions are "that the chemical weapons in West Germany will be moved to Johnston Island for destruction." There is no native constituency there to protest.

Lois Ember, Washington



Our latest CATALOG to better serve your research needs for Organic and Inorganic Chemicals.

- **Approximately 30,000 chemical listings now including**
  - **—CAS number**
  - **—Physical data**
- **Special list of Larger-than-Lab Quantities**
- **And other special sections**

Send for your copy today:

PFALTZ & BAUER, INC.
division of Aceto Corporation
172 East Aurora Street
Waterbury, CT 06708
203-574-0075

Disperse with Orzan®
Lignosulfonates

For more information on the complete line of Orzan Lignosulfonates from ITT Rayonier Chemical Products and how you can make them work for you fill out and mail this coupon.

I would like to have information on the use of Orzan as a:

- ☐ Flotation Aid
- ☐ Binder
- ☐ Extender
- ☐ Surfactant
- ☐ Dispersant

☐ Please have a sales representative contact me.

Name_____
Company_____
Address_____
City_____ State_____ Zip_____
Phone (_____) _____

ITT RAYONIER
CHEMICAL PRODUCTS
1177 Summer St., Stamford, Ct. 06904